THE 2000 FIRST ROBOTICS COMPETITION

TEAM UPDATE #2

Date: January 14, 2000

IF YOU HAVE QUESTIONS

If you have questions regarding the rules, competition events, shipping, etc. please refer to sections 1.2-1.4 in the Administrative section of the manual. Do not send questions to webmaster@usfirst.org or others not listed in these sections.

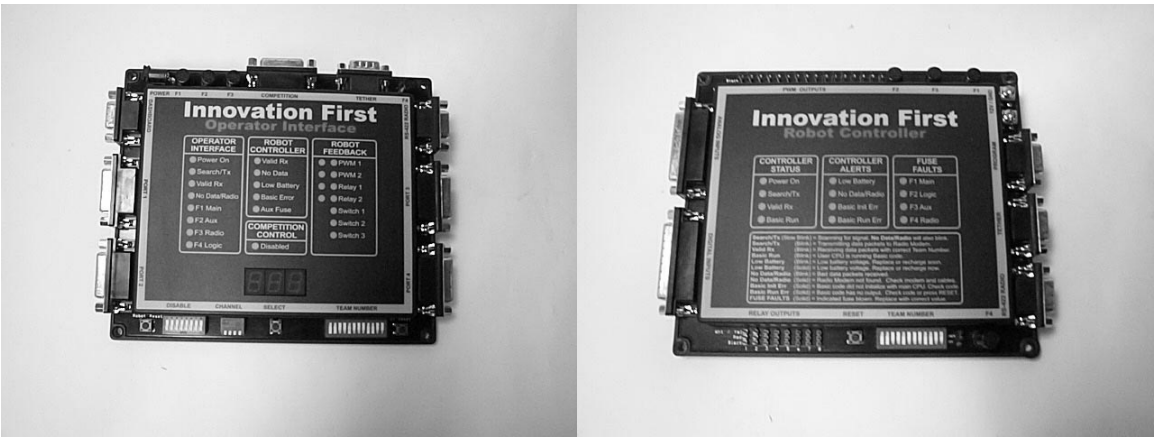
SMALL PARTS INC.

In order to receive shipments from SPI, teams must register with them. There is a registration form in the Robot section of the Manual under Appendix D. You may also visit their site at http://www.smallparts.com/first.

CORRECTIONS AND UPDATES TO THE MANUAL

In Appendix G: Supplier Contact Information of the Robot section of the manual, there is an error in the S-B Power Tool Company phone number. The new number is (908) 769-2457.

In Kit of Parts Album, Picture 7 from the Loose Items in the Green Container was missing. The picture are as follows:



Picture 1: Operator Interface (1), Robot Controller (1)

The following section of the manual have been rewritten as follows:

1.3.5 RAMP DESCRIPTION

The ramp is approximately 8-feet wide with an approximate 15° incline rising to 1-foot at the peak. The structure consist of 2x12-inch lumber set 16-inches on center and ½-inch plywood. The surface of the ramp is covered with the same carpet as the playing field, but in a different color The ramp rests directly on the playing field carpet.

DQ13. You are not allowed to intentionally block an opponent's view of the playing field.

The first part of the scoring description under Rule SC1 has been corrected as follows:

1. Each alliance will receive one (1) point for each of their yellow balls that is within the goal and not in contact with or supported by their robot. Each alliance will receive five (5) points for each black ball that is within the goal and not in contact with or supported by their robot. *Refer to Figure 1.2 Ball Positions and Values.*

Rule C1 is updated as follows:

C1. The control system is provided to allow wireless control of the robots. The Operator Interface, Robot Controller, Servos, Speed Controllers, Relay Modules, Radio Modems, Batteries, Battery Charger, Power Supply, 9 pin cables, circuit breakers, and fuse may not be tampered with, modified or adjusted in any way, with the following exceptions:

- The dip switches on the Operator Interface and Robot Controller may be set as appropriate.
- The program select jumper on the Robot Controller may be set as appropriate.
- The user programmable code in the Robot Controller may be customized.
- The Speed Controllers may be calibrated as described in owner's manuals.
- Addition of an Anderson Power Products quick disconnect to the battery charger leads.

Tampering includes drilling, cutting, machining, gluing, rewiring, etc. All items listed in Rule C1 must be mounted without alteration. Marking control system components, such as with a marker or a stick on label, is not considered tampering.

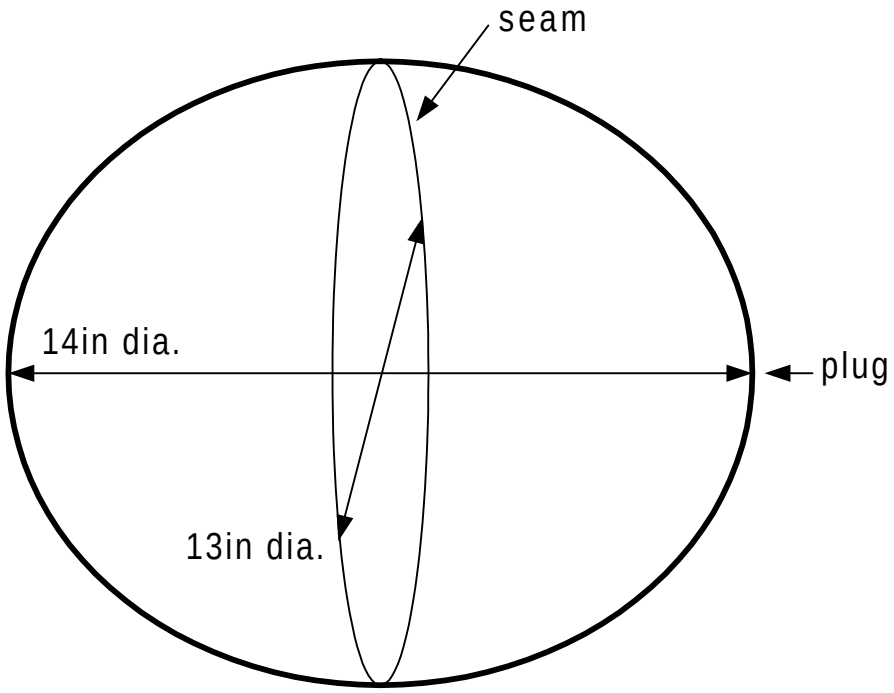
C29. The joystick may be modified (rewired, disassembled, cut, etc.) in order to use the potentiometer and switches in a different manner. If by modifying the joystick you end up breaking it or destroying it, you will not be provided with a replacement.

Clarification of M20:

M20. All fabrication should cease once your robot has been shipped to an event. Off-the-shelf materials may be purchased and brought to the event site. Fabrication may resume once you have checked-in at an event site on Thursday. Fabrication of robot parts when a robot is at an event must take place on-site. *See M14.*

BALL INFLATION UPDATE

The balls will be inflated until the seam reaches a nominal 13 inches in diameter. The diameter perpendicular to the plane of the seam will be a nominal 14 inches. There is a ± ½ inch tolerance in both dimensions.



FIELD CONSTRUCTION

The following has been added to the Field Bill of Materials (BOM). Please make a note of it.

60	Alliance station	P16	horizontal barrier	8	1-1/4" ∅ Schedule 40 Aluminum pipe	90-1/2"

Located at the top center of each safety shield on the field side is the team number LED display. These displays are 1' 9-¼"wide, 9-¾"high, and protrude into the field 2-¼".

The full height of the front of the Alliance Stations is 7 feet from the carpet to the top of the safety shield. The safety shield sits directly on top of the diamond plate barrier flush on the field side.

There is a 20' piece of ½" EMT conduit centered on the floor at both ends of the field. It is placed 10" from the face of the Alliance Stations and fastened to the carpet with 2" cloth duck tape. The purpose being to hold the balls in consistent position for the start of each match.

CH PRODUCTS

Additional Joysticks for FIRST Robotics Competition teams can be purchased directly from the manufacturer CH Products at a special discount.

To order:
Contact Shasta or Tracy in the CH Products sales department
Phone: 760-598-2518 x108
Fax:760-598-2524
email: shasta@chproducts.com
Type of joystick: Flightstick 200-502BL / Color of Flightstick: Black
Type of joystick: Flightstick 200-502 / Color of Flightstick: Neutral

Cost: $20.00 + tax and shipping.

RULES QUESTIONS & ANSWERS

Q13. What happens if our shipping crates exceeds the maximum weight?
A13. You will be responsible of paying the extra cost for the extra weight over the 400 pound limit. The 400 pound limit was set by the shipper and we cannot guaranty that a crate heavier than this amount will arrive in a timely manner.

Q14. When an ally machine picks up its partner to score additional points, do the machines have to be on the ramp in order to earn the points, or can they be anywhere on the floor? If picking them up on the court instead of the ramp is allowed, does the machine that is picking them up also have to be clear of the floor, or can the machine picking up the partner be touching the floor as long as the machine being lifted does not?
A14. The robot being picked up may not be touching any part of the field. Both robots can be anywhere on the field. Refer to rule SC1 Part 3. Only the robot that is being picked up has to be clear of the floor. The alliance partner picking it up does not have to be off the floor, however, the robot doing the lifting would not earn any points.

Q15. If we are hanging from the bar, can an opponent machine attach to us and hoist themselves off the ground?
A15. No. Only alliance partners may hoist themselves off the ground by attaching themselves onto their partners.

Q16. Rule V3 spells out minor penalties. Most involve loss of points. Are those points docked before the game score is worked out or after?
A16. Yes, those points are deducted at the end of the match which affect the match score which in turn affects the qualifying points received.

Q17. We interpret rule SC1 part 3, to mean that if your robot attaches itself to the bar and lifts both itself and its ally off the ramp, a total of 30 points are scored- i.e., 10 for the robot attached to the bar and off the ramp, 10 for the ally lifted off the ramp, and "AN ADDITIONAL" 10 points for the act of one lifting the other. Is this a correct interpretation?

A17. No, that is not the correct interpretation. The act of lifting your alliance partner is a substitution for hanging not in addition to. The most points you could receive is 20 if you are hanging and lift your partner.

Q18. May we use a purchased drill chuck with the drill motors?

A18. Not unless it is from SPI.

Q19. May I build a commutator (slip ring) to transmit electricity?

A19. No. Allowed electrical connectors are butt connectors, spade connectors, ring terminals, wire nuts, and the models of Anderson Power Products connectors provided in the kit.

Q20. Is it permitted for the human player to return balls to the robot via the ball chute?

A20. No. The ball chute is only for the robot to pass balls to the human player. Refer to GM17.

Q21. Is any alloy of steel allowed?

A21. Yes. Refer to the Additional Hardware List.

Q22. Is it possible to drive 2 seat motors with 1 speed controller?

A22. Yes. See Rule C14.

Q23. May we use acrylic sheets?

A23. Only if purchased from SPI. Polycarbonate is listed on the Additional Hardware List.

Q24. May players throw from the side area of the Alliance Station onto the field?

A24. No, balls must go over polycarbonate shield. Refer to GM17.

Q25. Looking at Rule DQ12, does it mean we would be disqualified if we have a ramp and our opponent drives up onto it? Would they get the points in Rule SC1 part 3 because they are not touching the ramp or the carpeted surface?

A25. No you would not be disqualified. Yes, they would get the 10 points.

Q26. May we build a net?

A26. The net has to be made of materials provided in the Kit or from the Additional Hardware List and as long as it does not entangle other robots. If this occurs, you will be asked to change the mechanism. Refer to Rule M18.

Q27. SPI sells spring steel, are we allowed to use this to make springs?
A27. Rule K4 states that you cannot construct your own springs. If you want to purchase springs, they would have to come from SPI.

Q28. Is it a violation of the rules to remove balls from your opponent's goal and place them in your own goal?
A28. No, there is no rule against that.

Q29. Is a robot allowed to INTENTIONALLY block the view between the operators and robots of their opponents?
A29. That would not violate DQ9, however, that would violate the new Rule DQ13.

Q30. If a ball deflates or pops while in either the Red or Blue goal, will the point or points count for that alliance?
A30. It would depend in part on how the ball got popped, but in general the points would still count. That would be a judgment call that referees would have to make.

Q31. Will the striped cross bar that we can hang from be a solid piece of steel? 4 robots x 130 lbs. could damage the bar.
A31. As you can see on the BOM, that bar and its supporting members are schedule 40 steel, unlike the rest of the field. There is always the chance that bar may be damaged and we will be prepared to replace it if necessary.

Q32. Are there any time limitations for robots hanging from the striped bar, to prevent a robot from hanging at the beginning of the match and keeping all other robots off?
A32. There is no time limit.

Q33. Can a human player "give" a ball to the robot over the 7' barrier of the playing field? Specifically, can the human feed balls to a robot directly (simultaneous contact of the ball - human touching one end, robot touching the other)
A33. Yes, technically that would be legal. However, neither robot nor human player should reach beyond the safety shield.

Q34. If we are one of the top 8 teams and a higher ranked team asks us to partner with them for the elimination matches, are we still allowed to compete if we decline?
A34. Yes, but no other alliance can ask your team to ally. For example, if you are number 5 and number 1 chooses you and you decline, 2-4 cannot pick you. However, your team may still pick an alliance partner when it becomes your turn. Refer to GM26.

Q35. May human players assist each other physically, such as one climbing onto another to gain height?
A35. No, because that would be a safety hazard.

Q36. Is it okay to interface with the goal? For example, an alignment V mechanism?
A36. No. Refer to Rule M7.

Q37. I am working with the control system and last year there was information in Robot section of the documentation about pin out and a basic program to run. This year I do not see this. I have the CD and looking through the web sites I am having trouble finding this. Can you help out in any way. I looked through the kits and all I found was the documentation on added features for the new controllers.
A37. As noted in The Robot section of the manual, documentation for the control systems is now provided by the manufacturer, Innovation First, on their web site at http://www.innovationfirst.com. The CD is from Parallax, Inc. and contains the PBASIC programming tool and PBASIC language documentation that you need if you wish to reprogram the control system. The source code for the default program is provided by Innovation First along with the rest of the control system documentation.

Q38. Do we decide with our alliance where each robot is to start or is the start position of each robot designated?
A38. No. FIRST will assign each team to a specific starting location. This is necessary to insure that the matches move along in a timely manner.

Q39. In Appendix A: Rules, rule S7 says that latex tubing may be used for the purpose of storing energy to launch balls. Are other launcher designs acceptable, for example, using the air cylinders or motor driven arms?
A39. Yes, you may use other mechanisms to launch balls. Please exercise caution when designing such a system because this is a potential safety hazard. I do not recommend using the pneumatic cylinders if there is a risk that the internal piston will slam against the ends of the cylinder.

Q40. With respect to a ball scoring in the goal, what does "supported by the robot" really mean?
A40. As for the definition of "supported by", we mean that if the robot was removed the ball would fall from the goal. It is unlikely that referees will actually move the robots, because that would take a long time and slow down the matches. Instead, the referees will use their best judgment as to what balls would fall. We feel that it will be fairly clear given the geometry of the goal and the way that balls pile up. The best way not to get penalized for supporting a ball is to make sure that your robot is away from the goal when the match ends.

Q41. We are using rollers and we are planning to paint them. May we put sand on the paint to create friction?
A41. No, that would count as a non-decorative addition, therefor it would need to be on the Kit List or the Additional Hardware list.

Q42. According to S7, the only projectiles a robot is allowed to launch are balls. How do we define projectiles? For example, say a robot is designed to shoot a grappling hook onto the center bar. Since the hook is tethered, would this be considered a projectile? Would it be in violation of DA4? What precautions would need to be taken to eliminate this problem? For example, the hook could be attached to the end of telescoping tubing that causes it to move in a linear path, which makes it more like an elevator powered by surgical tubing.

A42. We will use a common-sense definition of a projectile. To attempt to put that into words, it would be something as follows: A projectile is an unsupported object that goes flying out from the robot and follows a parabolic path. A flying grappling hook would be considered a projectile even though it might be attached to the robot with a tether cord. The tether would prevent it from violating Rule DA4, but might present a risk of entanglement and violate Rule M18.

Putting a hook on the end of a telescoping tube would mean that it is not interpreted as a projectile. The hook itself would then need to be designed so as not to present a risk of entanglement or have sharp points that would present a safety hazard.

Q43. Rule # SC1-3 on Page 13, Our question pertains to the definition of hanging, is a robot considered hanging if it is hanging off an opponents robot who is in turn hanging off the yellow striped pipe?

A43. As long as your robot is not touching the surface of the playing field, it is considered "hanging" with respect to scoring points. Hanging from your alliance partner's robot is allowed. Hanging from an opponent's robot is not allowed due to the potential for damage.

Q44. We realize a robot is not allowed to clamp on anything except the center pole, could however a robot place a device that would be around a pole, but not touching it, until another robot pushes it?

A44. Per Rule M7, robots should not be designed to clamp onto other parts of the playing field, so that strategy would not be allowed.

Q45. I was wondering whether or not it is legal or not to connect a PC to the OI? The dashboard program at the Innovation First website implies so, but I want to be sure. If it is legal are their any rules concerning the PC connection what so ever? What OS is legal, specs, bi-directional communication etc. Lastly may we write our own version of the Dashboard program to use instead of Innovation First's if we so chose?

A45. See Section 2.3.3 in The Robot section of the manual.

Q46. In Team Update #1 that was just released, rule M20 states that all fabrication should cease after shipping the robot. Does this include the fabrication of replacement parts to have on hand if a component breaks, or only new systems that would be bolted on once reaching the event?

A46. It means that fabrication of all parts for the robot should cease once the robot ships. This is a change from the last few years that should eliminate confusion about what could and couldn't be worked on after the robot ships. The shipping deadline is now as it was originally intended to be, a deadline for the completion of work on the robot. Note that you may order off-the-shelf raw materials (angle iron, sprockets, etc.) to have on hand for fabrication work at an event, but you may not machine, assemble, etc. those materials after shipping the robot.

Q47. Are we allowed to intentionally switch the orientation of our machine once the match has begun? Also, in the answer to Q11, if the orientation switches back and forth between two different options during the round, which would be considered the "normal" orientation in terms of mounting the light?

A47. The robot is allowed to change orientation during the match. The "normal" orientation would be the orientation the robot is in at the start of the match.